

## REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

New claim 23 has been added.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1-9, 11-21, and 23 are now pending in this application.

### **Rejections under 35 U.S.C. § 103**

Claims 1, 2, 4, 8, and 12-20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,232,010 to Cisar *et al.* (hereafter “Cisar”). This rejection is respectfully traversed.

Cisar discloses a barrier and flow control device for an electrochemical reactor that includes a flow field 102, a gas diffusion or distribution layer 104, a membrane 106, a separator 112, and electrodes 108, 109. See col. 8, line 66, to col. 9, line 44; Figures 13 and 15. Cisar discloses that the flow field 102 can be made from metal foam, expanded metal sheet, or sintered metal particles or sintered metal fibers, and that the gas distribution layer 104 can be made from sintered metal particles or sintered metal fibers. See col. 5, lines 2-6, of Cisar. Cisar further discloses that the flow field 102 and the gas distribution layer 104 are metallurgically bonded, such as by sintering. See col. 4, lines 55-59; col. 5, lines 6-9, of Cisar.

On page 2 of the Office Action the Office identifies the separator 112 as a collector layer, the gas distribution layer 104 as a diffusion layer, and the flow field 102 as an anchoring layer. However, as noted on page 3 of the Office Action, Cisar does not disclose or

suggest at least one anchoring layer having a thickness of less than 0.5 mm or “at least one contact layer sintered to a side of said diffusion layer which is not connected to said anchoring layer,” as recited in claim 1.

Furthermore, Cisar does not disclose a stack, “wherein the at least one diffusion layer is a metal mesh, wherein the metal mesh comprises woven, knitted, or braided metal wires,” as recited in claim 1. Cisar discloses that the gas distribution layer 104 can be made from sintered metal particles or sintered metal fibers. See col. 5, lines 2-6, of Cisar. However, a mass of sintered metal particles or sintered metal fibers is not a metal mesh of woven, knitted, or braided metal wires because a sintered mass is not woven, knitted, or braided, as recited in claim 1. Furthermore, metal fibers are not metal wires because the former are relative short, cut metal pieces while the latter are long, drawn metal members. Thus, Cisar does not disclose or suggest all of the features of amended claim 1.

The Office states on page 3 of the Office Action that Applicant discloses in the specification of the application that both the anchoring layer and the contact layer are comprised of metal fibers. The Office appears to imply with this statement that the anchoring layer and contact layer are equivalence or similar enough to be interchangeable, particularly in consideration of the later argument on page 3 of the Office Action regarding the duplication of parts. However, Applicant respectfully disagrees. An anchoring layer is different from a contact layer, both in structure and in function. For example, an anchoring layer can function to assure a bond between a diffusion layer and a collector layer, and a contact layer can serve, along with a PEM membrane, as a location for a reaction. In addition, an anchoring layer can have a different permeability than the contact layer. For example, the permeability of an anchoring layer can be as high as possible while the permeability of a contact layer can be relatively low. Thus, an anchoring layer and contact layer are not equivalents or interchangeable as implied or argued by the Office.

The Office argues on page 3 of the Office Action that it would have been obvious to apply the flow field layer 102 of Cisar as a contact layer on an opposing side of the gas distribution layer 104 of Cisar because this would be a mere duplication of parts. To support this, the Office cites *St. Regis Paper Co. v. Beemis Co. Inc.*, 193 USPQ 8, 11 (Ct. App. 7th

Cir. 1977) and *In re Harza*, 124 USPQ 378 (CCPA 1960). Copies of these cases are included with this response for reference. However, legal precedent can provide a rationale to support obviousness only if the facts in the case are sufficiently similar to those in the application. See MPEP § 2144, Part III.

*St. Regis Paper* regarded a patented bag that had multiple layers. 193 USPQ at 11. The defendant demonstrated that the use of multiple layers had been known in the bag industry for many years and the patentee admitted that it had sold multiwall bags for some time. *Id.* The case in *St. Regis Paper* regarded a situation in which all of the features were known in the art and could be combined to provide the patented bag, as noted by the court as a “fusion of old elements.” *Id.* Here, the Office has not demonstrated that all of the features of claim 1 are known in the art. In fact, the Office notes on page 3 of the Office Action that Cisar does not disclose or suggest “at least one contact layer sintered to a side of said diffusion layer which is not connected to said anchoring layer,” as recited in claim 1. Thus, the facts of *St. Regis Paper* are not sufficiently similar to those of this application and *St. Regis Paper* does not support a rationale for obviousness, as argued by the Office.

*In re Harza* regarded a claim to a water stop with a plurality of elongated ribs on opposite sides. 124 USPQ at 379. A prior art reference disclosed a water stop with a single rib on each side of the web. *Id.* at 380. The court stated that the mere duplication of parts, such as duplicating the single web disclosed by the prior art reference, has no patentable significance unless a new and unexpected result is produced. *Id.* In this application the Office has not demonstrated a feature or component, such as contact layer, that can be duplicated. As noted above, the Office notes on page 3 of the Office Action that Cisar does not disclose or suggest a contact layer that can be duplicated in the first place. Furthermore, an anchoring layer and contact layer are not equivalents or interchangeable, as discussed above. Thus, the facts of *In re Harza* are not sufficiently similar to those of this application and *In re Harza* does not support a rationale for obviousness, as argued by the Office.

In regard to the anchoring layer thickness of claim 1, the Office argues on pages 3-4 of the Office Action that Cisar discloses that it is generally known to decrease the thickness of fuel cell plates, citing col. 2, lines 59-61, of Cisar. However, this passage regards porous

metal plates, not anchoring layers. The Office also cites col. 8, lines 64-65, of Cisar. This passage only regards porous substrates, not anchoring layers. Thus, the Office has not provided any factual or evidentiary support for its rationale that it would have been obvious to provide an anchoring layer with the thickness recited in claim 1.

Additionally, the Office argues on page 4 of the Office Action that it would have been obvious to provide an anchoring layer with the thickness recited in claim 1 because this would involve the discovery or optimization of a result-effective variable. However, a parameter must first be recognized as a result-effective variable before the determination of the optimal or workable ranges of the variable can be characterized as routine experimentation. See MPEP § 2144.05, Part IIB. The Office has not demonstrated that that an anchoring layer thickness is recognized as a result-effective variable in the prior art. Therefore, it would not have been obvious to provide an anchoring layer with the thickness of claim 1, as argued by the Office.

For at least the reasons discussed above, Cisar does not render claims 1, 2, 4, 8, and 12-20 to be unpatentable because Cisar does not disclose or suggest all of the features of claim 1. Reconsideration and withdrawal of this rejection is respectfully requested.

Claim 3 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Cisar, as applied to claim 1, and further in view of [www.webelements.com](http://www.webelements.com), nickel to Winter (hereafter “Winter”). This rejection is respectfully traversed. Winter fails to remedy the deficiencies of Cisar discussed above in regard to independent claim 1, from which claim 3 depends. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 5 and 6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Cisar, as applied to claim 1, and further in view of U.S. Patent No. 5,441,822 to Yamashita *et al.* (hereafter “Yamashita”). This rejection is respectfully traversed. Yamashita fails to remedy the deficiencies of Cisar discussed above in regard to independent claim 1, from

which claims 5 and 6 depend. Reconsideration and withdrawal of this rejection is respectfully requested.

Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Cisar, as applied to claim 1, and further in view of U.S. Patent No. 5,482,792 to Faita *et al.* (hereafter “Faita”). This rejection is respectfully traversed. Faita fails to remedy the deficiencies of Cisar discussed above in regard to independent claim 1, from which claim 7 depends. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 9 and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Cisar, as applied to claim 1, and further in view of U.S. Patent No. 4,791,035 to Reichner (hereafter “Reichner”). This rejection is respectfully traversed. Reichner fails to remedy the deficiencies of Cisar discussed above in regard to independent claim 1, from which claims 9 and 11 depend. Reconsideration and withdrawal of this rejection is respectfully requested.

Claim 21 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Cisar, as applied to claim 1, and further in view of U.S. Patent No. 5,512,145 to Hollenberg (hereafter “Hollenberg”). This rejection is respectfully traversed. Hollenberg fails to remedy the deficiencies of Cisar discussed above in regard to independent claim 1, from which claim 21 depends. Reconsideration and withdrawal of this rejection is respectfully requested.

#### **New Claim**

New claim 23 has been added. Claim 23 depends from claim 1 and is allowable over the prior art for at least the reasons discussed above and for its additional recitations.

**Conclusion**

Applicant submits that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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